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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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EXAMINER	
CUTLER, ALBERT H	
ART UNIT	**PAPER NUMBER**
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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/811,861	LEE ET AL.	
	Examiner	Art Unit	
	Albert H. Cutler	2622	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *04 September 2007*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-8 and 10* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-8 and 10* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

1. This office action is responsive to communication filed on September 4, 2007. Claims 1-8 and 10 are pending in the application.

Response to Arguments

2. Applicant's arguments filed September 4, 2007 have been fully considered but they are not persuasive.

3. Applicant argues, "the cited references, whether considered individually or in any combination, fail to disclose or suggest the invention set forth in claim 1 wherein the baseband processor directly displays an image, which exists in the mobile phone, on the LCD module through the image controller, without activating the color interpolation device, the RGB-to-YUV converter and the compression engine of the image controller and the sensing module."

4. The Examiner respectfully disagrees. As stated in the previous office action, Kim teaches of directly displaying an image, which exists in the mobile phone, on the LCD module through the image controller(Kim teaches that input image data, stored on the phone in SDRAM, is directly displayed on an LCD unit, paragraph 0069.), without activating the color interpolation device, RGB-to-YUV converter and compression engine of the image controller and the sensing module(Kim teaches that input image signals are decompressed, sent to the post processor, and displayed, paragraphs 0068-0069. The post processor circuit is the YUV-to-RGB circuit(see claim 1 rationale). Therefore, when directly displaying the image signal, the RGB-to-YUV converter, compression engine, sensing module, and any color interpolation devices are not

activated.). An image which exists in the mobile phone is directly displayed(paragraph 0069) after being processed by a post-processing circuit. The post-processing circuit(40, figure 2) simply performs YUV-to-RGB conversion and dithering(paragraph 0041). The RGB-to-YUV converter(30, figure 2) is not activated, as the RGB-to-YUV converter is only activated when reading image data directly from the sensor(paragraph 0038), and therefore does not encompass all image data which "exists in the mobile phone". The compression engine(70) is not activated, as compression is only used when transmitting images due to excessive size of the digital image signals(paragraph 0039). Kim makes no mention of a color interpolation device. However, Tang et al. teach that the color interpolation device(912, figure 12A) is activated for processing "raw sensor data". Thus, the color interpolation device taught by the combination of Kim and Tang et al. would not be activated when displaying an image "which exists in the mobile phone", but rather only when outputting image data from an image sensor.

5. Applicant argues, "the RGB image signal with complete color information can be stored directly in the buffer and immediately output to the LCD module through the image interface, for displaying without performing any conversion."

6. The Examiner respectfully disagrees. It is not clear from the current claim language that an RGB image signal with complete color information is stored directly in a buffer and immediately output to the LCD without performing any conversion. Rather, the added limitation to claim 1 calls for a processor which directly displays an image, which exists in the mobile phone, on a display. The statement that the image "exists in the mobile phone" is broad, and does not restrict the image to one directly stored in a

buffer. Rather the image could be any of one captured by the camera and displayed, read from a memory and displayed, or transmitted from another external device and displayed, as long as the image exists in the camera.

7. Therefore, the Examiner is maintaining the rejection.

Claim Rejections - 35 USC § 103

8. The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

9. Claims 1-8 and 10 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kim(US 2003/0179939) in view of Lim(US 2004/0204144), and further in view of Tang et al.(US 2004/0061902).

Consider claim 1, Kim teaches:

A digital camera image controller apparatus for a mobile phone(figures 1 and 2, paragraphs 0003-0005, and 0029), comprising:

an LCD module(302, figure 2), as a display means of the mobile phone, to display information for communication(The display means displays both image and graphics data, paragraphs 0041, 0058-0061. Communication information is commonly displayed as graphics data in a mobile device.);

a sensing module("CMOS Image Sensor", 305, figure 2), to sense optical signal of an external image and accordingly produce an RGB image signal(paragraph 0038); and

an image controller(The image controller has many parts, figures 1 and 2.), having:

an RGB-to-YUV converter("pre-processor", 30, paragraph 0038), to convert the RGB image signal into a YUV image signal(paragraph 0038);

a YUV-to-RGB converter("post-processor", 40, paragraph 0041), to convert the YUV image signal into the RGB image signal(paragraph 0041);

a compression engine("Encoder/Decoder", 70, paragraph 0039), to compress or decompress the YUV image signal in order to produce a compressed or decompressed YUV image signal(paragraph 0039); and

a buffer("First SDRAM", 306, and "Second SDRAM", 308, paragraph 0069), to temporarily store the RGB image signal and the compressed YUV image signal(The two SDRAM's are used to store and retrieve the image data, paragraph 0069. Cache memory(60) can also be used as a buffer, paragraph 0046.),

wherein the RGB image signal in the buffer is able to directly display on the LCD module(paragraph 0069), and

wherein, in operating, the processor directly displaying an image, which exists in the mobile phone, on the LCD module through the image controller(Kim teaches that input image data, stored on the phone in SDRAM, is directly displayed on an LCD unit, paragraph 0069.), without activating the color interpolation device, RGB-to-YUV

converter and compression engine of the image controller and the sensing module(Kim teaches that input image signals are decompressed, sent to the post processor, and displayed, paragraphs 0068-0069. The post processor circuit is the YUV-to-RGB circuit(see claim 1 rationale). Therefore, when directly displaying the image signal, the RGB-to-YUV converter, compression engine, sensing module, and any color interpolation devices are not activated.). An image which exists in the mobile phone is directly displayed(paragraph 0069) after being processed by a post-processing circuit. The post-processing circuit(40, figure 2) simply performs YUV-to-RGB conversion and dithering(paragraph 0041). The RGB-to-YUV converter(30, figure 2) is not activated, as the RGB-to-YUV converter is only activated when reading image data directly from the sensor(paragraph 0038), and therefore does not encompass all image data which "exists in the mobile phone". The compression engine(70) is not activated, as compression is only used when transmitting images due to excessive size of the digital image signals(paragraph 0039). Kim makes no mention of a color interpolation device.

Kim teaches of a processor for a multimedia device(paragraph 0003). Kim also teaches that said multimedia device can be a mobile phone(paragraph 0005). However, Kim does not explicitly teach a baseband processor, connected to circuit of the mobile phone in order to perform required communication processing. Also, because Kim does not explicitly teach the baseband processor, Kim does not teach that the compressed YUV image signal in the buffer is sent to the baseband processor for further processing.

Lim is similar to Kim in that Lim deals with an image sensor which can be a CMOS image sensor(paragraph 0035). Lim is further similar in that captured YUV image data is converted into RGB data in order to be displayed on a display(paragraph 0040). Likewise, Lim teaches that the image sensor is in a mobile device(paragraph 0032).

However, in addition to the teachings of Kim, Lim teaches a baseband processor("RF module", 21, figures 1 and 5), connected to circuit of the mobile phone in order to perform required communication processing(Paragraphs 0037 and 0038. The RF module(21) performs both voice communication and image transmission/reception.). Lim also teaches that the compressed YUV image signal in the buffer is sent to the baseband processor for further processing(YUV data, the image data obtained by the camera, is sent to the RF module where it is further processed by being transmitted. RGB data is simply used for image display, paragraphs 0037-0040.).

Therefore, it would have been obvious to a person having ordinary skill in the art at the time of the invention to connect the mobile camera apparatus taught by Kim to a baseband processor taught by Lim in order to perform high-speed data transmission of images from remote locations via a readily accessible communication network(Lim, paragraphs 0005 and 0006).

However, the combination of Kim and Lim does not explicitly teach of a color interpolation device, to interpolate color for each pixel of the RGB image signal produced by the sensing module and thus obtain an interpolated RGB image signal with complete color information.

Tang et al. is similar to Kim in that Tang et al. teach of obtaining raw images from a sensor, which images have one color space(i.e. RGB or YUV), converting those images to a second color space(i.e. RGB or YUV), and outputting the images(figure 12A, paragraphs 0003, 0064-0066).

However, in addition to the combined teachings of Kim and Lim, Tang et al. teach of a color interpolation device(912, figures 12a and 12b), to interpolate color for each pixel of the RGB image signal(paragraphs 0046-0050, figure 12b) produced by the sensing module("sensor data", 910, figure 12a) and thus obtain an interpolated RGB image signal with complete color information(paragraphs 0064-0066).

Kim makes no mention of a color interpolation device. However, Tang et al. teach that the color interpolation device(912, figure 12A) is activated for processing "raw sensor data". Thus, the color interpolation device taught by the combination of Kim and Tang et al. would not be activated when displaying an image "which exists in the mobile phone", but rather only when outputting image data from an image sensor.

Therefore, it would have been obvious to a person having ordinary skill in the art at the time of the invention the have a color interpolation device as taught by Tang et al. for interpolating color for each pixel of the RGB image signal taught by the combination of Kim and Lim, for the benefit of obtaining correct color information, and generating color images which have full resolution(Tang et al., paragraph 0002).

Consider claim 2, and as applied to claim 1 above, Kim teaches that the sensing module includes a sensor(305) to collect optical signals of the external image and sense

the optical signal for producing the RGB image signal(paragraph 0038). Kim does not explicitly teach that the sensing module includes a lens.

However, **Official Notice** (MPEP § 2144.03) is taken that both the concepts and advantages of including a lens along with the image sensor in a sensing module are well known and expected in the art. It would have been obvious to a person having ordinary skill in the art at the time of the invention to include a lens to direct light onto the image sensor taught by Kim in order to properly direct the light and obtain a clear, in-focus image, representative of the actual photographed environment as seen by the user.

It should be noted that the common knowledge for including a lens in a sensing module **is taken as admitted prior art** because Applicant failed to seasonably traverse this common knowledge from the amendment filed on September 4, 2007. See MPEP § 2144.03. In re Chevenard, 60 USPQ 239 (CCPA 1943).

Consider claim 3, and as applied to claim 1 above, Kim teaches the compression engine is a JPEG codec(paragraph 0040).

Consider claim 4, and as applied to claim 1 above, Kim teaches a sensor interface connected to the sensing module(The pre-processing circuit(30) provides an interface between the image sensor(305) and second system bus(9). See figure 2).

Consider claim 5, and as applied to claim 1 above, Kim teaches a display interface(44) connected to the LCD module(302, paragraph 0061).

Consider claim 6, and as applied to claim 1 above, Kim does not explicitly teach a host interface connected to the baseband processor.

Lim teaches a host interface(0023) connected to the baseband processor(0021, paragraphs 0037-0038).

Consider claim 7, and as applied to claim 1 above, Kim teaches in operating, both the RGB image signal and the compressed YUV image signal temporarily stored in the buffer come from the sensing module(The RGB data comes from the sensing module, and the YUV data is derived from the RGB data. Therefore, the YUV data comes from the sensing module as well, paragraph 0038.).

However, the combination of Kim and Lim does not explicitly teach that the RGB data is interpolated data.

Tang et al. teach of interpolation(see claim 1 rationale).

Consider claim 8, and as applied to claim 1 above, Kim teaches of a decoder circuit(70) for decoding compressed image data(paragraphs 0039-0040). However, Kim does not explicitly teach that the image data comes from a baseband processor.

Lim teaches in operating, both the RGB image signal and the compressed YUV image signal temporarily stored in the buffer come from the baseband processor(Lim

teaches that image data can be transmitted/received via the RF module(i.e. the baseband processor). See paragraphs 0037-0038, claim 1 rationale.).

However, the combination of Kim and Lim does not explicitly teach that the RGB data is interpolated data.

Tang et al. teach of interpolation(see claim 1 rationale).

Consider claim 10, and as applied to claim 1 above, the combination of Kim and Lim does not explicitly teach a color correction device arranged in between the color interpolation device and RGB-to-YUV converter to correct nonlinear color response due to the electronic sensor characteristics and different light sources.

However, Tang et al. teach a color correction device(914, figure 12a) arranged in between the color interpolation device(912) and RGB-to-YUV converter(920) to correct nonlinear color response due to the electronic sensor characteristics and different light sources(See figure 12a, paragraph 0004.).

Conclusion

10. The objection made by the Examiner to the claims is hereby removed in view of Applicant's response.

11. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within

TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Albert H. Cutler whose telephone number is (571)-270-1460. The examiner can normally be reached on Mon-Fri (7:30-5:00).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Ngoc-Yen Vu can be reached on (571)-272-7320. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

NGOC-YEN VU
SUPERVISORY PATENT EXAMINER